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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

NGUYEN, DUNG X

ART UNIT	PAPER NUMBER
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2631

DATE MAILED: 09/11/2003

21

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/147,230

Applicant(s)

OLSSON ET AL.

Examiner

Dung X Nguyen

Art Unit

2631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 July 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 30 - 58 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 31 - 38, 44, and 46 - 53 is/are allowed.
- 6) ☒ Claim(s) 30, 39 - 43, 45, 54 - 57, and 58 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 30 December 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

***Response to Arguments***

1. Applicant's arguments filed on July 2, 2003 have been fully considered but not persuasive.

The parameter  $Y_{n,k}$  shown in equations for estimating the argument function  $\alpha_k$  must be supported by the original disclosure. Any parameter changing makes the result of the equation altered also.

Based on the above rationale, it is believed that the parameter  $Y_{n,k}$  has changed the outcome of the argument function  $\alpha_k$ . Therefore, the rejections are still maintained.

Also, claims 30, 41 - 43, 45, and 58 are moot on the ground of rejection based on the new found references.

***Specification***

2. The amendment filed on 06 March 2002 to claims 39, 40, 54, and 55 introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

The parameter  $Y_{n,k}$  is not shown and supported by the original disclosure as filed.

***Claim Rejections - 35 USC § 112***

3. The followings are quotations of the first paragraph and the second paragraph of 35 U.S.C. 112:

*(1) The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.*

Art Unit: 2631

4. **Claims 39, 40, and 54 - 57 are rejected** under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding to claims 39, 40, 54, and 55 the parameter  $Y_{n,k}$  is not shown and supported by the original disclosure.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

*A person shall be entitled to a patent unless –*

*(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.*

*(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.*

6. **Claims 30, 43, and 45 are rejected** under 35 U.S.C. 102(b) as being anticipated by Ikeda et al. (US patent # 5,506,836).

Regarding claim 30, Ikeda et al. teaches (figure 3):

- A sampling oscillator 855;
- Control means (868, 855, 856, 853, 854, 857, 858, 859, 860, 861, 861, 863, 964, 865) for controlling the sampling oscillator 855 and comprising estimation means (853,

Art Unit: 2631

854, 857, 858, 859, 860, 861, 862, 863, 864, 865) for estimating timing deviations of the sampling oscillator 855;

- The estimation means inherent operating entirely on frequency domain input data (column 3, lines 25 – 31).

Regarding claim 43, the limitations are analyzed in the same manner set forth as claim 30.

Regarding claim 45, Ikeda et al. teaches (figure 3):

- Control 868 for controlling the sampling oscillator 855 with a feedback signal representing an estimation means (853, 854, 857, 858, 859, 860, 861, 862, 863, 864, 865) for estimating timing deviations of the sampling oscillator 855;
- The estimation means inherent being derived directly on frequency domain input data (column 3, lines 25 – 31).

7. **Claims 30, 41, 42, 43, and 45 are rejected** under 35 U.S.C. 102(b) as being anticipated by Gledhill et al. (US patent # 5,345,440).

Regarding claim 30, Gledhill et al. teaches (figure 8):

- A sampling oscillator 40;
- Control means 11, 12, 21, 22, 31, 32, 33, 36, 37, 38, 40 (also see figure 4) for controlling the sampling oscillator 40 and comprising estimation means 30 for estimating timing deviations of the sampling oscillator 40;
- The estimation means inherent operating entirely on frequency domain input data (column 1, lines 6 – 12).

Regarding claim 41, Gledhill et al. further discloses wherein on start up, frame timing is adjusted until received frames are sampled within a signal interval (abstract).

Regarding claim 42, Gledhill et al. further discloses means responsive to a feedback control for the sampling oscillator 40 to adjust the frame timing so that frame synchronization is maintained (abstract).

Regarding claim 43, the limitations are analyzed in the same manner set forth as claim 30.

Regarding claim 45, Gredhill et al. teaches (figure 8):

- Control loop 30, 31, 32, 33, 36, 37, 38 for controlling the sampling oscillator 40 with a feedback signal representing an estimation means 30 for estimating timing deviations of the sampling oscillator 40;
- The estimation means inherent operating directly on frequency domain input data (column 1, lines 6 – 12).

8. **Claim 45 is rejected** under 35 U.S.C. 102(e) as being anticipated by Janesch et al. (US patent # 6,018,556).

Regarding claim 45, Janesch et al. teaches (figure 2):

- Controlling (164, 165, 201, 202, 203, 204, 167, 154, 155) the sampling oscillator 154 with a feedback signal 167 representing an estimation phase deviation (164, 165, 201, 202, 203, 204), the estimation of timing phase deviation inherently being directly derived from frequency domain input data (column 5, line 64 to column 6, line 14).

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

*(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.*

10. **Claims 30, 43, and 45 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Davies et al. (US patent # 5,953,311).

Regarding claim 30, Davies et al. shows (figure 6):

Art Unit: 2631

- Controlling the feedback loop (38, 40, 42, 44, 46, 48, 50, 52, 54) representing an estimation of phase deviation during the symbol period  $T_s$  (column 7, lines 37 – 55 and column 3, lines 63 – 64);
- The estimation of phase deviation inherent operating entirely (or being derived directly) from frequency input data (col. 3, lines 63 – 64 and col. 4, line 66 to col. 5, line 6).

Davies et al. differs from the instant claimed invention that it does not show the sampling oscillator. However, the sampling oscillator must be presented in every communication circuit. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to recognize that Davies et al. must have a sampling oscillator in its circuit for providing the sampling time.

Regarding claims 43 and 45, the limitations are analyzed in the same manner set forth as claim 30.

11. **Claim 58 is rejected** under 35 U.S.C. 103(a) as being unpatentable over Schmidl et al. (US patent # 5,732,113), further in view of Ikeda et al. (US patent # 5,506,836).

Regarding claim 58, Schmidl et al. teaches (figure 1) that the data is transmitted in frames, each frame having a cyclic prefix which is a repetition of part of the frame (column 2, lines 38 – 47).

Schmidl et al. differs from the instant claimed invention that it does not show the receiver received information from the above transmitter comprising a sampling oscillator and a controller for controlling the sampling oscillator and for estimating timing deviations of the sampling oscillator operating entirely on frequency domain input data. However, Ikeda et al. discloses: a sampling oscillator 855 and a control loop (853, 854, 857, 858, 859, 860, 861, 862, 863, 864, 865, 868, 855, 856) for controlling the sampling oscillator 855 and comprising estimation means (853, 854, 857, 858, 859, 860, 861, 862, 863, 864, 865) for estimating timing deviations of the sampling oscillator 855 inherent operating entirely on frequency domain input

Art Unit: 2631

data (column 3, lines 25 – 31). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to implement Ikeda et al. into Schmild et al. for providing the whole system, which has an OFDM receiving apparatus to enables stable reproduction of a clock signal and as a result enables accurate demodulation of the OFDM modulated signal.

***Allowable Subject Matter***

12. **Claims 31 – 38, 44, and 46 – 53 are allowed.** The following is a statement of reasons for the indication of allowable subject matter:

Regarding to claim 31, the prior art of record fails to show or render obvious of a receiver for use in an OFDM transmission system in which data is transmitted in frames, each frame having a cyclic prefix, which is a repetition of part of the frame, the receiver comprising:

A sampling oscillator;

An adaptive equalizer having an equalizer inverse channel model;

Separation means for separating the equalizer inverse channel model into a first and a second part, the first part being independent of sample timing and the second part being dependent on sample timing; and

Control means for controlling the sampling oscillator based on the second part.

Regarding to claim 44, the prior art of record fails to show or render obvious of an OFDM transmission system in which data is transmitted in frames, each frame having a cyclic prefix, which is a repetition of part of the frame, the OFDM transmission system comprising:

A receiver comprising a sampling oscillator;

An adaptive equalizer having an equalizer inverse channel model;



A separation circuit for separating the equalizer inverse channel model into a first and a second part, the first part being independent of sample timing and the second part being dependent on sample timing; and

A controller for controlling the sampling oscillator in dependence on the second part.

Regarding to claim 46, the prior art of record fails to show or render obvious of an OFDM system in which data is transmitted in frames, each frame having a cyclic prefix, which is a repetition of part of the frame, and in which the receiver comprises an adaptive equalizer having a equalizer inverse channel model, a method of synchronizing a receiver sampling oscillator, the method comprising:

Separating the equalizer inverse channel model into a first and a second part, the first part being independent on sample timing and the second part being dependent on sample timing; and

Controlling a sampling oscillator based upon the second part.

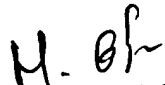
### ***Contact Information***

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung X. Nguyen whose telephone number is (703) 305-4892. The examiner can normally be reached on Monday through Friday from 9:00 AM to 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Ghayour Mohammad H. can be reached on (703) 306-3934. The fax phone numbers for this group is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3800.

DXN  
August 28, 2003

  
**MOHAMMAD H. GHAYOUR**  
**PRIMARY EXAMINER**